

## PORTABLE COMPUTER HAVING ARTICULATED DISPLAY

### TECHNICAL FIELD

The present invention relates in general to a portable computer and, more particularly to a computer having a display screen which may be used to input information.

### BACKGROUND OF THE INVENTION

Portable computing devices, including computers, laptop computers, notebook and subnotebook computers, and personal data organizers (PDA's) are typically unitary devices having a clam-shell configuration, with a base including the keyboard, optional hard drive and floppy disk drive unit, and other electrical components including a central processing unit CPU and memory, and a display component pivotally coupled to the base by a hinge. The display is movable about the hinge between a closed position, with the display screen positioned adjacent the keyboard, and an open position, with the display screen inclined at a viewing angle. With its reduced size and weight, this type of device is conveniently portable, allowing an individual to carry the computer and use the computer at different locations.

The reduced size, while improving the portability of the device, often creates discomfort when the computer is used for extended periods of time. For example, the user may have difficulty in orienting the display at a convenient viewing angle. With its clamshell configuration, the screen is positioned just above the keyboard, requiring the user to open the screen to an angle of at least 140° to conveniently view the screen without straining the neck, shoulders and upper back. However, in some situations factors such as the available space, lighting and the like may prevent the user from sufficiently opening the computer to conveniently view the display screen. It may also be difficult to place the display screen at the preferred viewing distance and still eliminate distracting reflections from environmental light sources. A portable computer in which the angle and height of the display may be adjusted relative to the base is desirable.

With some portable computers, the display is provided by a touch sensitive screen which may be used to input information by touching specific areas of the screen with an instrument or finger. An example of such computers is a notebook computer where data is entered solely through the touch sensitive screen, eliminating the need for a keyboard. Other types of computers include both a keyboard and a touch sensitive screen, providing the user with the option of entering data through the screen or keyboard.

U.S. Pat. No. 5,268,817 discloses an example of a portable computer which includes a keyboard and a touch sensitive screen. The display screen is mounted in an outer frame, which is in turn hingedly attached to the base in a clamshell configuration. The display screen is pivotal within the outer frame to orient the screen in a first position, with the screen facing in the general direction of the keyboard, and a second position flipped 180° relative to the first position. With the screen in the first position, the display may be moved between open and closed positions by pivoting the outer frame relative to the base in the same manner as standard portable computers. When the display screen is flipped 180° and the outer frame pivoted to the closed position covering the keyboard, the display screen is exposed such that the computer functions as a standard notebook computer. The disclosed computer combines the advantages of a notebook computer, where the individual

enters information in the same matter as writing the information on a notepad, with the advantages of standard portable computer. However, the disadvantages created by the reduced size of the computer are present in the disclosed computer. A computer in which the screen may be conveniently adjusted to a variety of positions, including one in which the display covers the keyboard with the screen exposed, is desirable.

### OBJECTS AND SUMMARY OF THE INVENTION

It is a primary object of this invention to provide a portable computer having an articulated display.

It is another object of this invention to provide a portable computer in which the display may be retained in a selected one of a plurality of different positions.

It is yet another object of this invention to provide a portable computer in which the display may be lowered onto the keyboard in a position leaving the screen exposed.

It is still another object of this invention to provide a portable computer in which the height and angle of the display relative to the base may be adjusted to a convenient viewing position.

A more general object of this invention is to provide a portable computer which is lightweight and convenient to transport, and which may be economically manufactured and maintained.

In summary, this invention provides a lightweight portable computer which is particularly convenient to use. The computer includes a base having an upper surface with a keyboard, a bottom surface and a peripheral edge joining the upper and bottom surfaces and a display having a front surface including a screen for displaying information, a back surface, and a peripheral edge joining the front and back surfaces. The display is coupled to the base by an arm assembly including a pair of spaced arm portions and a rigid connecting portion extending between the arm portions. The arm portions each have a first end pivotally coupled to the base edge for movement of the arm assembly between a closed position, with the arm portion substantially parallel to the base, and an open position, with the arm portion oriented at an angle relative to the base. The arm portions each have a second end pivotally coupled to the display edge for pivotal movement of the display member relative to the arm portion to move the display member between a plurality of positions relative to the arm member.

Additional objects and features of the invention will be more readily apparent from the following detailed description and appended claims when taken in conjunction with the drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front plan view of a portable computer constructed in accordance with the present invention, shown with the display in an open position.

FIG. 2 is a top plan view of the computer of FIG. 1.

FIG. 3 is a side view of the computer of FIG. 1.

FIGS. 4 and 5 are a side views similar to FIG. 3, shown with the display in other positions.

FIG. 6 is a top plan view of the computer of FIG. 1, shown with the display overlying the base in one position.

FIG. 7 is a view similar to FIG. 6, shown with the display overlying the base in a second position.

FIG. 8 is a bottom plan view of the computer of FIG. 1.